REMARKS/ARGUMENTS

Claims 1-5 remain in this application. Claims 1-5 have been amended. New claims 6-9, which are dependent on claims 2, 7, and 4 respectively, have been added. No new matter has been added or claimed.

Support for new claims 6–9 can be found in the specification on page 17, lines 12-14; page 28, lines 15-17, page 39, lines 12-16; page 38, lines 10-12, page 42, lines 1-4; and page 14, lines 1-2, respectively.

In the Final Office Action for the original application, dated February 17, 2005 the Examiner rejected Claims 1-5 under 35 U.S.C. 101 stating that "the claimed invention is directed to "non-statutory subject matter. The basis of this rejection is set forth in a two-prong test of: (1) whether the invention is within the technological arts; and (2) whether the invention produces a useful, concrete, and tangible result."

Regarding Claim 3, the Examiner stated that "claim 3 is directed to an econometric engine for modeling sales as a function of price. Claim 3 recites 'an imputed variable generator' and 'coefficient estimator coupled to the imputed variable generator, and wherein imputed variables generated by the variable generator are used by the coefficient estimator to create a sales model'. However, these claims are directed towards software, which alone is not statutory. In order to be statutory, this software must be embodied in a tangible medium. Since no software embodied on a tangible medium exist, claim 3, and all claims that depend from it (claims 4 and 5) are non-statutory."

Base claim 3 has now been amended to recite, in part "<u>A computer program product in a computer-readable media, the computer program product comprising:</u>
an econometric engine for modeling sales as a function of price, the engine further comprising: . . " (emphasis added), and hence base claim 3 and dependent claims 4 and 5 are now clearly directed to statutory subject matter.

Regarding Claim 1, the Examiner stated that "the preamble of claim 1 recites 'A method for creating a sales model for a plurality of products, the method being implemented as a plurality of program instructions in a computer system'. However, since no computer hardware or software embodied on a tangible medium are in the body of the claim, claim 1 and all claims that depend from it (claim 2) are therefore non-statutory."

Base claim 1 has now been amended to recite, in part "A computer-implemented method for creating a sales model for a plurality of products, said method comprising the steps of: . . " (emphasis added), and hence base claim 1 and dependent claim 2 are now clearly directed to statutory subject matter.

In the same Office Action the Examiner has rejected Claim 3 under 35 U.S.C. 112, second paragraph stating that it is "indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The preamble of claim 3 recites 'An econometric engine for modeling sales as a function of price, the engine being implemented in a computer system'. However, it is not clear as to whether the applicant is claiming the combination of the engine and the computer system, or just the econometric engine alone, therefore making the claim indefinite. Since the claim can be interpreted as just claiming econometric engine alone, and not a computer system to make the engine run, this claim is also subject to a 35 USC 101 rejection as discussed above."

Base claim 3 has now been amended as noted above. The claim as amended is clearly directed to a computer program product in a computer-readable media. As such, claim 3 now distinctly claims the subject matter Applicants regard as the invention, and said subject matter is now clearly statutory.

The Examiner has rejected Claim 1 under U.S.C. 103(a) as being unpatentable over Ouimet et al. (US 6,078,893), and further in view of Garg, (US 6,044,357). Regarding Claim 1, the Examiner has stated that "Creating a plurality of demand groups, wherein each demand group is a set of at least one product, and wherein at least one of the demand groups is a set of at least two products, (col. 5, lines 45-64, [shows demand is described for each item in a given

group where the product is represented by the item, in this case, one of the demand groups being a set of at least two products is inherent since Ouimet et al. discloses that 'each item in a given group' implies that there are more than one items in a group since the sales of 'one' item can depend upon the parameters of all the other items]); Creating a sales model as a function of price for each demand group, (col. 6, lines 5-11, [shows a one-dimensional demand model which scales the amount of sales in this case, the variables are simply the prices {p}, and the demand parameters qi scales the amount of sales and gi, which describes the sensitivity of the item to price]); Ouimet et al. does not specifically disclose creating a market share model for each product in each demand group, however does disclose defining a new market model that represents and describes how the demand parameters are expected to vary, where the demand parameters relate to the products in each demand group in col. 6, lines 17-25. However, Garg discloses: creating a market share model for each product in each demand group, (col. 5, lines 38-41, [market share model to characterize the demand distribution for each brand, in this case the group is represented by the brand]). Garg discloses this limitation in an analogous art for the purpose of showing that market share models are used to set base stock levels for the inventory management. It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to create a market share model for each product in each demand group with motivation of providing a representation of how the demand distribution is represented through products."

Base claim 1 has been amended to recite "A computer-implemented method for creating a sales model for a plurality of products, said method comprising the steps of:

creating a plurality demand groups, wherein each demand group is a group of highly substitutable products, further wherein each demand group is a set of at least one product and at least one of the demand groups is a set of at least two products;

creating a sales model as a function of price for each demand group; and

creating a market share model for determining the fraction of the sales of each demand group comprised by each product." (emphasis added).

Support for the amendment can be found in the specification at page 61, lines 14-16. The demand groups of the instant invention are not analogous to the demand model taught in Ouimet et al. In Ouimet et al., the "demand model" is the model used to predict consumer demand for a particular item (Col. 3, lines 55-57). The demand groups of the instant invention, on the other hand, are groups of highly substitutable products (or items). (Specification, page 13, lines 11-13). An initial data set is used to group highly substitutable products into demand groups. (Specification, page 16, lines 20-21). Only then is a sales model created for each demand group (Specification, page 66, lines 5-10). It is the sales model, not the demand group, which is used to predict consumer demand as does the demand model in Ouimet et al. (Col. 5, lines 45-64).

Ouimet et al. does not teach nor suggest grouping a plurality of highly substitutable products into demand groups which can then be used in a sales model to predict demand for the entire group. In Ouimet et al., a system of coupled equations is used to describe the demand for each item (or product) in a given group. (Col 5, lines 62-64). The instant invention may advantageously be used to group highly substitutable products into demand groups to help solve the problem, inter alia, of forecasting demand for large numbers of products which are interrelated (See specification, page 2, lines 5-9).

Base claim 1 has also been amended to recite:

"A computer-implemented method for creating a sales model for a plurality of products, said method comprising the steps of:

creating a plurality demand groups, wherein each demand group is a group of highly substitutable products, further wherein each demand group is a set of at least one product and at least one of the demand groups is a set of at least two products;

creating a sales model as a function of price for each demand group; and

creating a market share model for determining the fraction of the sales of each demand group comprised by each product." (emphasis added).

Support for the amendment can be found in the specification at page 68, lines 5-8. In Garg, "market share model" is defined as a forecast of a firm's relative market share of the external market for a particular brand or brands. (Col. 4, lines 48-59). In the instant invention, the market share model is the fraction of a demand group's total sales comprised by a particular product within the demand group. (Specification, page 68, lines 5-8). The instant market share model does not predict a product's share of the external market, but rather the internal analysis of a product's share of its demand group's total sales within the user's store or chain.

Neither Garg nor Ouimet et al. teach nor suggest a market share model which describes a product's share of total demand obtained by a demand group within a firm's store or chain as disclosed by the instant invention. This novel aspect of the instant invention allows one skilled in the art to calculate demand group demand as a function of price and then use market share to calculate a product's demand form the demand group demand. (Specification, page 115, lines 1-3). Hence, base claim 1, and claims 2, 6, 7 and 8, which are dependent upon claim 1, are allowable over the cited art.

The Examiner has rejected Claims 3-5 under 35 U.S.C. 103(a) as being unpatentable over Chavez et al. (US 6,684,193), and further in view of Ouimet et al.

Regarding Claim 3, the Examiner stated that "Chavez et al. discloses: A imputed variable generator for generating imputed econometric variables; (col. 8, lines 22-27, [consumption distribution {inferred} from components]); A coefficient estimator coupled to the imputed variable generator, and wherein imputed variables generated by the variable generator are used by the coefficient estimator to create a sales model as a function of price, [col. 15, lines 6-14, [revenue coefficient]). Chavez does not specifically disclose the terms 'variable generator' or 'coefficient estimator', however, does disclose an engine (col. 18, lines 23-27) that produces the same results, and therefore represents the econometric engine that contains the 'variable generator' and the 'coefficient estimator', Therefore, the 'variable generator' and the 'coefficient estimator' are inherent within Chavez et al. Chavez fails to disclose including a base price variable and the base volume Variable, but does disclose the generator of a model for the demand of a product in col. 53-63. However, Ouimet et al. discloses: including a base price variable and a base volume variable, (Col. 10, lines 60-65, where the base parameters in the demand model are the amount of sales and price here the amount of sales is the volume and the price is the price). Ouimet et al. disclose this limitation in an analogous art for the purpose of disclosing a one-dimensional demand model. It would have been obvious to one of ordinary skill in the art at the time of the

applicant's invention to include a base price variable and a base volume variable with the motivation of having variables available to formulate a base demand model."

Regarding Claim 4, the Examiner stated that "Chavez et al. discloses: Wherein the imputed variable generator receives raw data, and cleans the data, (Col. 20, lines 24-32, [filtering and then identifying variables])."

Regarding Claim 5, the Examiner stated that "Chavez et al. discloses: Wherein the coefficient estimator creates the sales model by creating a sales model for a demand group and creating a market share model for a product in the demand group, (col. 7, lines 8-19, [model where a demand for products is expressed], col. 13, lines 28-43, [creating a model that includes lost market share])."

Neither Chavez et al. nor Ouimet et al. teach nor suggest generating imputed econometric variables by inferring useful variables from missing or incomplete data sets. Chavez et al. defines a set of resources (e.g. components) which are used to support desired refinements (or products). (Col. 3, lines 25-35). After an analysis of total demand for a computer system product, a demand distribution is generated for said product. (Col. 8, lines 5-22). From this demand distribution a consumption distribution of corresponding components for said computer system product is determined. (Col. 8, lines 22-28).

In the instant invention, on the other hand, imputation is used to obtain posterior inference when some data points are missing or data sets are incomplete in order to generate useful econometric variables. A novel and advantageous aspect of the current invention is that even when various product parameters are missing or incomplete, they may be imputed according to the present invention. (See page 14, lines 1-2 of the specification as filed). For example, when information regarding promotional variables is missing or incomplete, other data such as sales volume is used to impute a refined promotional variable (page 45, lines 5-18 of the specification as filed).

An example of advantageously using the novel imputation aspect of the instant invention to infer base price variables is given in the specification on page 24, lines 15 – 23, and page 25, lines 1 -2. Here, a base price variable is inferred from the cleansed data set for a specific time window. Said base price variable may advantageously be further refined by, for example, correcting for promotional pricing (See, page 26, lines 2 – 22). Promotional prices are inferred form the cleansed data set and used to impute a refined base price variable.

Neither Chavez et al. nor Ouimet et al. teach nor suggest the <u>imputation</u> steps as recited in the claims of the instant invention. The imputation step solves the problem of generating econometric variables from missing or incomplete data sets. Chavez et al. does not generate such variables but simply determines a consumption distribution for secondary demand for components resulting directly from a given primary demand distribution of the corresponding system. The instant invention, on the other hand, takes point of sale information for various products, which may have missing or incomplete data, and imputes useful variables which may then be used for optimization or other useful purposes. (See, specification, p. 23, lines 4 – 7). Imputation of econometric variables is neither taught nor suggested in the prior art. Hence, base claim 3, and claims 4, 5 and 9 which depend from claim 3, are allowable over the cited art.

Furthermore, base claim 3 has now been amended to recite:

"A computer program product in a computer-readable media, the computer program product comprising:

an econometric engine for modeling sales as a function of price, the engine further comprising:

an imputed variable generator for generating imputed econometric variables including a base price variable and a base volume variable<u>, wherein said base volume variable represents the volume of product units sold in the absence of promotional effects</u>; and

a coefficient estimator coupled to the imputed variable generator, and wherein imputed variables generated by the variable generator are used by the coefficient estimator to create a sales model as a function of price." (emphasis added).

Ouimet et al. uses base parameters in the demand model to scale the amount of sales and the price. (Col. 10, lines 60-65). The base parameters are simply item specific parameters used in the demand model. (Col. 10, lines 26-29). In the instant case, on the other hand, base price and base volume variables are generated from an initial data set which may have missing or incomplete data. In particular, base volume variables are imputed from the initial data set so that the effect of discount pricing or any other promotional effect is eliminated. (Specification, page 39, lines 16-23, and page 40, lines 1-3). Ouimet et al. does not teach nor suggest scaling base volume in a manner which corrects for promotional effects. Hence, base claim 3, and claims 4, 5 and 9 which depend from claim 3, are allowable over the cited art.

The Examiner has rejected Claim 2 under 35 U.S.C. 103(a) as being unpatentable over Ouimet et al. (US 6,078,893) as applied to Claim 1 above, and further in view of Garg, (US 6,044,357), and further in view of Chavez et al. (US 6,684,193). Regarding Claim 2, the Examiner stated that "both Ouimet et al. and Garg fail to disclose collecting raw data; and generating imputed variables from the raw data, wherein the imputed variables are used to create the sales model, as a function of price, but Ouimet et al. does disclose generating a sales model in Col. 6, lines 5-11. However, Chavez et al. discloses: collecting raw data; and generating imputed variables from the raw data, wherein the imputed variables are used to create the sales model, as a function of price, (Col. 20, lines 24-32, [filtering and then identifying variables], w/ col. 6, lines 5-11, [shows a one-dimensional demand model which scales the amount of sales, in this case, the variables are simply the price {p}, and the demand parameters q_i scales the amount of sales and g_i, which describes the sensitivity of the item to price]). Chavez et al. discloses this limitation in an analogous art for the purpose of identifying variables that go furthest in 'explaining' the uncertainty in the particular variable of interest'. It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to collect raw data; and generate imputed variables from the raw data, wherein the imputed variables are used to create the sales model as a function of price with the motivation of producing a sales model with unused data."

In light of the amendments to base claim 1 noted above, claim 2 is allowable over the cited art for at least the same reasons as claim 1 cited above.

In sum, base Claims 1 and 3, as well as dependent Claims 2, 4 and 5 have been amended and are now believed to be allowable. New Claims 6-9 have been added. Applicant respectfully suggests that dependent Claims 2, and 4-9 are allowable over the cited art for at least the same reasons as Claims 1 and 3 are allowable. Hence, the Examiner's rejection of dependant Claims 2, 4, and 5 are rendered moot in view of the amendment to base Claims 1 and 3.

Applicants believe that all pending Claims 1-9 are now allowable over the cited art and are also in allowable form and respectfully request a Notice of Allowance for this application from the Examiner. Although it is believed that no fees are due in connection with the filing of this Preliminary Amendment, the commissioner is authorized to charge any fees that may be due to our Deposit Account No. 50-2766 (Order No. DEM1P003). Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at telephone number 925-570-8198.

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